



INFINITI
ELECTRO-OPTICS

LWIR & MWIR Cameras Brochure

Infiniti's Thermal Imaging Camera Options



TECHNOLOGY

Thermal Imaging Advantages

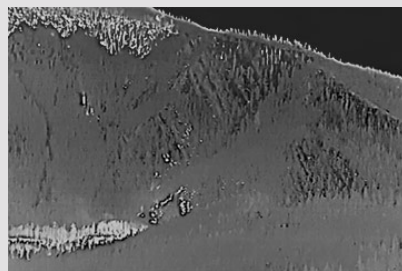
Infiniti offers both cooled MWIR and uncooled LWIR thermal imaging cameras. These cameras are called thermal cameras because they produce an image using naturally radiated thermal energy (heat) rather than reflected light like a visible/NIR camera. This provides significant advantages in surveillance, as no illumination is needed to see in complete darkness, and natural temperature differences make it possible to achieve long-range detection of potential threats.

With thermal imaging, warmer objects like humans, vehicles and animals become clearly visible against cooler backgrounds. Objects like these can be easily located and tracked with thermal imaging cameras regardless of lighting conditions, making thermal imaging an excellent solution for detection of threats at long distances day or night, even in complete darkness.

Another advantage of thermal cameras over visible cameras is their immunity to bright lights. When using standard visible or NIR camera systems at night, bright lights from vehicle headlights or handheld flashlights can cause overexposures and light flares on the images, making it difficult or impossible to see details and activities around those lights. Thermal imaging is unaffected in these scenarios and maintains a clear and detailed image around bright light sources.



Standard Visible+NIR
Forest fires with smoke



LWIR Thermal Image
Same scene, sees through smoke



Standard Visible+NIR Image
Vis+NIR scene



LWIR Thermal Image
Same scene, see video on our website for full example:
<https://infiti.ca/whythermal>

TECHNOLOGY

Cooled vs Uncooled

Long Wave Infrared (LWIR)

Infiniti uses cutting-edge 12 μ m LWIR VOx uncooled thermal sensors with resolutions up to 1280 $\times$ 1024 HD. The 12 μ m pixel pitch provides a narrower field of view without changing the lens, allowing it to achieve 40% further range than 17 μ m sensors.

These sensors are paired with large aperture lenses of $f/1.0$ – $f/1.3$, compared to the standard $f/1.5$ – $f/1.6$, allowing up to 2.3 times more heat to reach the sensor. This results in higher sensitivity, sharper images, and longer ranges, making LWIR one of the most cost-effective long-range imaging solutions.

Cooled Mid-Wave Infrared (MWIR)

Infiniti offers cooled thermal in SD or HD options. Our 15 μ m 640 $\times$ 480 InSb or MCT sensors are comparable to the standard MWIR offerings in the industry. Our 10 μ m 1280 $\times$ 1024 HD X-Hot sensor provides 400% higher resolution and 50% longer range than traditional 15 μ m sensors. This means a 400mm lens on our X-Hot sensor is equivalent to a 600mm lens on a traditional 15 μ m sensor allowing it to provide a narrower angle for more detail at long distances.

MWIR sensors use integrated cryo-coolers to cool the sensors down to -196°C (InSb) or -123°C (X-Hot). This exponentially increases the sensitivity of the thermal camera, allowing MWIR cameras to use smaller and more powerful lenses than uncooled LWIR cameras, however the cryo-coolers do require maintenance at intervals that vary depending on sensor type and environment.

Our new **Thermally Compensated Optics (TCO)** technology maintains MTF, back focal distance, and effective focal length across a wide range of operating temperatures. This TCO technology effectively mitigates challenges posed by thermal expansion. Paired with our HD InSb or X-HOT MWIR thermal cores, Infiniti's systems provide high contrast and ultra long distance infrared imaging for mission critical applications such as threat detection, surveillance, auto-tracking and targeting.

Our wide variety of MWIR sensors and lenses range from a 19–275mm $f/5.5$ zoom (28.4°–2.0° HFOV) with SD resolution to a 100–1215mm $f/4.0$ zoom lens (33.9–1.71° HFOV) with HD resolution, capable of human detection at over 50km based on DRI ratings in ideal conditions.



280mm
LWIR

1400mm
MWIR

19mm
LWIR

RATING STANDARDS

DRI Ratings

Thermal camera performance is often measured in DRI, which stands for Detection, Recognition and Identification. While some military personnel will understand these ratings, it is important to note that many end users are not familiar with what these ratings actually mean, and it is likely to be different than expected.

DRI: A misleading specification

DRI ratings are based on a specification from the 1950s called the Johnson Criteria which was developed around older sensor technology being displayed on low resolution CRT screens. The images on this page show the approximate level of detail required by the Johnson Criteria. If you show them to most end users, it is unlikely they will agree that these images represent their expectations of Detection, Recognition, and Identification. Infiniti lists these DRI numbers to offer simple comparisons with competing products; however our recommendation is to define thermal detail using Pixels Per Meter (PPM).

PPM: A better specification

PPM takes several factors into account to provide a single benchmark for the amount of detail provided by a camera which can be applied to any brand or model. Infiniti has developed a tool which simulates different lens and sensor combinations to display various PPM levels; this allows us to ensure our customers are getting the level of detail they require.



Human

(1.8m × 0.5m)

Detection



3.5 × 1 pixels / 2.1 ppm
(Something is there)

Recognition



11 × 3 pixels / 6.3 ppm
(A person is there)

Identification



23 × 6 pixels / 12.6 ppm
(The person looks like a civilian)

Vehicle

(2.3m × 2.3m)



2 × 2 pixels / 0.9 ppm
(Something is there)



6 × 6 pixels / 2.6 ppm
(A vehicle is there)



12 × 12 pixels / 5.2 ppm
(The vehicle looks like a minivan)

The examples here simulate the amount of detail if you were to digitally zoom into the image. **Please note that these image simulations assume optimum imaging conditions, however many factors such as atmospheric conditions, heat waves, available light, subject motion or camera shake can degrade image clarity, and most of these issues are amplified at longer distances.** Also note that the Johnson Criteria specification is based on a 50% probability that an object would be detected, recognized or identified at these distances (ignoring atmospheric factors).

For more information, please see our whitepaper about understanding DRI measurements at: www.infinitioptics.com/dri

LWIR FIXED CAMERA OPTIONS

Specifications



		5TI	9TI	13TI	19TI	25TI
Image Sensor		Uncooled Vanadium Oxide Microbolometer, 30Hz				
Resolution		640×512 or 1280×1024 pixels				
Pixel Pitch		12µm (40% further range than 17µm sensors)				
Focal Length		5mm f/1.0	9mm f/1.0	13mm f/1.0	19mm f/1.0	25mm f/1.0
Pixels Per Meter @ 1km		0.4ppm	0.8ppm	1.1ppm	1.6ppm	2.1ppm
Field of View	640×512	75° Horizontal FOV	46.2° Horizontal FOV	32.9° Horizontal FOV	22.9° Horizontal FOV	17.5° Horizontal FOV
	1280×1024†	113.9° Horizontal FOV†	81° Horizontal FOV†	61.1° Horizontal FOV†	44° Horizontal FOV†	34.2° Horizontal FOV†
Human DRI*	Detection	198m (648ft)	356m (1,167ft)	514m (1,685ft)	751m (2,463ft)	988m (3,241ft)
	Recognition	66m (216ft)	119m (389ft)	171m (562ft)	250m (821ft)	329m (1,080ft)
	Identification	33m (108ft)	59m (194ft)	86m (281ft)	125m (411ft)	165m (540ft)
Vehicle DRI*	Detection	479m (1,572ft)	863m (2,829ft)	1,246m (4,086ft)	1,821m (5,972ft)	2,396m (7,858ft)
	Recognition	160m (524ft)	288m (943ft)	415m (1,362ft)	607m (1,991ft)	799m (2,619ft)
	Identification	80m (262ft)	144m (472ft)	208m (681ft)	303m (995ft)	399m (1,310ft)
Drone DRI** (Small/Lrg)	Detection	51m / 264m	92m / 474m	133m / 685m	194m / 1,000m	255m / 1,318m
	Recognition	17m / 88m	31m / 158m	44m / 228m	65m / 334m	85m / 439m
	Identification	9m / 44m	15m / 79m	22m / 114m	32m / 167m	43m / 220m
Focus		Athermalized	Athermalized	Athermalized	Athermalized	Athermalized
Spectral Range		8,000–14,000nm (LWIR)				
Thermal Sensitivity		20–35mK				
Image Display Modes		White Hot, Black Hot, other color palettes available upon request				
Digital Zoom		1–8X Digital Zoom (depending on system)				
Video Output		IP/RTSP or custom				
Pan/Tilt Compatibility		Any system				

* While DRI ratings are based on the industry-standard Johnson's Criteria, they represent theoretical maximums under ideal conditions that typically exceed real-world performance. Additionally, a "Detection" rating means that a target will appear only as a tiny speck of pixels, rather than as a clearly defined or recognizable object. For more info, please see our whitepaper about understanding DRI at: www.infiniioptics.com/dri

** See DRI rating disclaimer above; Small distance based on 0.3m×0.2m target size (dimensions of a DJI Phantom), Large distance based on 2m×0.8m target size (dimensions of a DJI Agras T40/T30).

† HD sensor option coming soon.

Focal lengths and FOVs are within ±5%.

Specifications subject to change due to global supply chain constraints and material availability.

LWIR FIXED CAMERA OPTIONS

Specifications



		35TI	50TI	75TI	100TI	120TI
Image Sensor		Uncooled Vanadium Oxide Microbolometer, 30Hz				
Resolution		640×512 or 1280×1024 pixels				
Pixel Pitch		12µm (40% further range than 17µm sensors)				
Focal Length		35mm <i>f</i> /1.0	50mm <i>f</i> /1.0	75mm <i>f</i> /1.2 or <i>f</i> /1.0	100mm <i>f</i> /1.0	120mm <i>f</i> /1.4
Pixels Per Meter @ 1km		2.92ppm	4.2ppm	6.25ppm	8.33ppm	10.0ppm
Field of View	640×512	12.5° Horizontal FOV	8.78° Horizontal FOV	5.86° Horizontal FOV	4.4° Horizontal FOV	3.67° Horizontal FOV
	1280×1024 [†]	24.8° Horizontal FOV [†]	17.46° Horizontal FOV [†]	11.7° Horizontal FOV [†]	8.78° Horizontal FOV [†]	7.32° Horizontal FOV [†]
Human DRI*	Detection	1,383m (4,538 ft)	1,976m (6,483 ft)	2,965m (9,724 ft)	3,953m (12,965 ft)	4,743m (15,558 ft)
	Recognition	461m (1,513 ft)	659m (2,161 ft)	988m (3,241 ft)	1,318m (4,322 ft)	1,581m (5,186 ft)
	Identification	231m (756 ft)	329m (1,080 ft)	494m (1,621 ft)	659m (2,161 ft)	791m (2,593 ft)
Vehicle DRI*	Detection	3,354m (11,002 ft)	4,792m (15,717 ft)	7,188m (23,575 ft)	9,583m (31,433 ft)	11,500m (36,720 ft)
	Recognition	1,118m (3,667 ft)	1,597m (5,239 ft)	2,396m (7,858 ft)	3,194m (10,478 ft)	3,833m (12,573 ft)
	Identification	559m (1,834 ft)	799m (2,619 ft)	1,198m (3,929 ft)	1,597m (5,239 ft)	1,917m (6,287 ft)
Drone DRI** (Small/Lrg)	Detection	357m / 1,845m	510m / 2,635m	765m / 3,953m	1,021m / 5,270m	1,225m / 6,325m
	Recognition	119m / 615m	170m / 878m	255m / 1,318m	340m / 1,757m	408m / 2,108m
	Identification	60m / 307m	85m / 439m	128m / 659m	170m / 878m	204m / 1,054m
Focus		Athermalized	Athermalized	Motorized (<i>f</i> /1.2) or Athermalized (<i>f</i> /1.0)	Motorized or Athermalized	Motorized
Spectral Range		8,000–14,000nm (LWIR)				
Thermal Sensitivity		20–35mK				
Image Display Modes		White Hot, Black Hot, other color palettes available upon request				
Digital Zoom		1–8X Digital Zoom (depending on system)				
Video Output		IP/RTSP or custom				
Pan/Tilt Compatibility		Atlas/Rogue and up			Neptune/Sentry and up	

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** See DRI rating disclaimer above; Small distance based on 0.3m×0.2m target size (dimensions of a DJI Phantom), Large distance based on 2m×0.8m target size (dimensions of a DJI Agras T40/T30).

[†] HD sensor option coming soon.

Focal lengths and FOVs are within ±5%.

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LWIR ZOOM CAMERA OPTIONS

Specifications



		75TIZ	105TIZ	130TIZ	155TIZ
Image Sensor		Uncooled Vanadium Oxide Microbolometer, 30Hz			
Resolution		640×512 or 1280×1024 pixels			
Pixel Pitch		12μm (40% further range than 17μm sensors)			
Focal Length		26–75mm (2.8X) <i>f</i> /1.0	20–105mm (5X) <i>f</i> /1.2 (<i>f</i> /1.6 optional)	25–130mm (5X) <i>f</i> /0.8– <i>f</i> /1.2	32–155mm (4.8X) <i>f</i> /1.2
Pixels Per Meter @ 1km		6.25ppm	8.75ppm	10.8ppm	12.9ppm
Field of View	640×512	16.8–5.86° Horizontal FOV	21.7–4.19° Horizontal FOV	17.5–3.38° Horizontal FOV	13.7–2.84° Horizontal FOV
	1280×1024	32.9–11.7° Horizontal FOV	N/A	34.2–6.76° Horizontal FOV	27.0–5.67° Horizontal FOV
Human DRI*	Detection	2,965 m (1.84 mi)	4,150 m (2.58 mi)	5,139 m (3.19 mi)	6,127 m (3.81 mi)
	Recognition	988 m (0.61 mi)	1,383 m (0.86 mi)	1,713 m (1.06 mi)	2,042 m (1.27 mi)
	Identification	494 m (0.31 mi)	692 m (0.43 mi)	856 m (0.53 mi)	1,021 m (0.64 mi)
Vehicle DRI*	Detection	7,188 m (4.47 mi)	10,063 m (6.25 mi)	12,458 m (7.74 mi)	14,854 m (9.23 mi)
	Recognition	2,396 m (1.49 mi)	3,354 m (2.08 mi)	4,153 m (2.58 mi)	4,951 m (3.08 mi)
	Identification	1,198 m (0.74 mi)	1,677 m (1.04 mi)	2,076 m (1.29 mi)	2,476 m (1.54 mi)
Drone DRI** (Small/Lrg)	Detection	765 m / 3,953 m	1,072 m / 5,534 m	1,327 m / 6,852 m	1,582 m / 8,169 m
	Recognition	255 m / 1,318 m	357 m / 1,845 m	442 m / 2,284 m	527 m / 2,723 m
	Identification	128 m / 659 m	179 m / 922 m	221 m / 1,142 m	264 m / 1,362 m
Focus		Motorized Autofocus			
Spectral Range		8,000–14,000nm (LWIR)			
Thermal Sensitivity		20–35mK			
Image Display Modes		White Hot, Black Hot, other color palettes available upon request			
Digital Zoom		1–8X Digital Zoom (16X optional)			
Video Output		IP/RTSP or custom			
Pan/Tilt Compatibility		Neptune/Sentry and up	Neptune [†] /Sentry and up	Sentry and up	

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** See DRI rating disclaimer above; Small distance based on 0.3m×0.2m target size (dimensions of a DJI Phantom), Large distance based on 2m×0.8m target size (dimensions of a DJI Agras T40/T30).

[†] Neptune must use *f*/1.6 variation of the 105TIZ module.

Focal lengths and FOVs are within ±5%.

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LWIR ZOOM CAMERA OPTIONS

Specifications



		185TIZ	230TIZ	310TIZ-HD	365TIZ-HD
Image Sensor		Uncooled Vanadium Oxide Microbolometer, 30Hz			
Resolution		640×512 or 1280×1024 pixels			1280×1024 pixels
Pixel Pitch		12μm (40% further range than 17μm sensors)			
Focal Length		34-185mm (5.4X) f/1.2	26-230mm (8.8X) f/1.3	31-310mm (10X) f/1.3	36-365mm (10X) f/1.5
Pixels Per Meter @ 1km		15.4ppm	19.2ppm	25.8ppm	34.6ppm
Field of View	640×512	12.9-2.38° Horizontal FOV	16.8-1.91° Horizontal FOV	N/A	N/A
	1280×1024	25.5-4.75° Horizontal FOV	32.9-3.82° Horizontal FOV	27.8-2.84° Horizontal FOV	24.1-2.41° Horizontal FOV
Human DRI*	Detection	7,313m (4.54 mi)	9,092m (5.65 mi)	12,254m (7.61 mi)	14,428m (8.96 mi)
	Recognition	2,438m (1.51 mi)	3,031m (1.88 mi)	4,085m (2.54 mi)	4,809m (2.98 mi)
	Identification	1,219m (0.76 mi)	1,515m (0.94 mi)	2,042m (1.27 mi)	2,405m (1.49 mi)
Vehicle DRI*	Detection	17,729m (11.02 mi)	22,042m (13.7 mi)	29,708m (18.46 mi)	34,979m (21.74 mi)
	Recognition	5,910m (3.67 mi)	7,347m (4.57 mi)	9,903m (6.15 mi)	11,660m (7.25 mi)
	Identification	2,955m (1.84 mi)	3,674m (2.28 mi)	4,951m (3.08 mi)	5,830m (3.62 mi)
Drone DRI** (Small/Lrg)	Detection	1,888m / 9,750m	2,347m / 12,122m	3,164m / 16,338m	3,725m / 19,237m
	Recognition	629m / 3,250m	782m / 4,041m	1,055m / 5,446m	1,242m / 6,412m
	Identification	315m / 1,625m	391m / 2,020m	527m / 2,723m	621m / 3,206m
Focus		Motorized Autofocus			
Spectral Range		7,000-14,000nm (LWIR)			
Thermal Sensitivity		20-30mK			
Image Display Modes		White Hot, Black Hot, other color palettes available upon request			
Digital Zoom		1-8X Digital Zoom (16X optional)			
Video Output		IP/RTSP or custom			
Pan/Tilt Compatibility		Sentry and up			Sigma and up

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** See DRI rating disclaimer above; Small distance based on 0.3m×0.2m target size (dimensions of a DJI Phantom), Large distance based on 2m×0.8m target size (dimensions of a DJI Agras T40/T30).

Focal lengths and FOVs are within ±5%.

Specifications subject to change due to global supply chain constraints and material availability.

LWIR ZOOM CAMERA OPTIONS

Specifications



		75TIZ-FHD	155TIZ-FHD	230TIZ-FHD	365TIZ-FHD
Image Sensor		Uncooled Vanadium Oxide Microbolometer, 30Hz			
Resolution		1920×1080 pixels			
Pixel Pitch		8μm (210% further range than 17μm sensors, 50% further range than 12μm sensors)			
Focal Length		26–75mm (2.8X) <i>f</i> /1.2	32–155mm (4.8X) <i>f</i> /1.2	26–230mm (8.8X) <i>f</i> /1.5	36–365mm (10X) <i>f</i> /1.5
Pixels Per Meter @ 1km		15.4ppm	19.4ppm	28.1ppm	43.8ppm
Field of View		32.9–11.7° Horizontal FOV	27–5.67° Horizontal FOV	32.9–3.82° Horizontal FOV	24.1–2.41° Horizontal FOV
Human DRI*	Detection	4,447 m (2.76 mi)	9,190 m (5.71 mi)	13,637 m (8.47 mi)	21,642 m (13.45 mi)
	Recognition	1,482 m (0.92 mi)	3,063 m (1.9 mi)	4,546 m (2.82 mi)	7,214 m (4.48 mi)
	Identification	741 m (0.46 mi)	1,532 m (0.95 mi)	2,273 m (1.41 mi)	3,607 m (2.24 mi)
Vehicle DRI*	Detection	10,781 m (6.7 mi)	22,281 m (13.84 mi)	33,063 m (20.5 mi)	52,469 m (32.6 mi)
	Recognition	3,594 m (2.23 mi)	7,427 m (4.61 mi)	11,021 m (6.85 mi)	17,490 m (10.87 mi)
	Identification	1,797 m (1.12 mi)	3,714 m (2.31 mi)	5,510 m (3.42 mi)	8,745 m (5.43 mi)
Drone DRI** (Small/Lrg)	Detection	1,148 m / 5,929 m	2,373 m / 12,254 m	3,521 m / 18,183 m	5,588 m / 28,856 m
	Recognition	383 m / 1,976 m	791 m / 4,085 m	1,174 m / 6,061 m	1,863 m / 9,619 m
	Identification	191 m / 988 m	395 m / 2,042 m	587 m / 3,030 m	931 m / 4,809 m
Focus		Motorized Autofocus			
Spectral Range		8,000–14,000nm (LWIR)			
Thermal Sensitivity		35mK			
Image Display Modes		White Hot, Black Hot, other color palettes available upon request			
Digital Zoom		1–8X Digital Zoom			
Video Output		IP/RTSP or custom			
Pan/Tilt Compatibility		Neptune and up	Sentry and up		Sigma and up

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Focal lengths and FOVs are within ±5%.

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MWIR SD CAMERA OPTIONS

Specifications



		275CTZ	715CTZ	700CTZ	905CTZ	1400CTZ
Image Sensor		High-Sensitivity Cooled InSb or MCT Detector, 30Hz				
Resolution		640×480 or 640×512 pixels				
Pixel Pitch		15µm				
Focal Length		19–275mm (14X) <i>f</i> /5.5	50–715mm (14X) <i>f</i> /5.5	36–700mm (19X) <i>f</i> /4.0	72–905mm (12X) <i>f</i> /4.0	85–1400mm (16X) <i>f</i> /5.5
Pixels Per Meter @ 1km		18.3ppm	47.7ppm	46.7ppm	60.3ppm	93.3ppm
Field of View		28.4–2.0° Horizontal FOV	11.0–0.77° Horizontal FOV	15.2–0.79° Horizontal FOV	7.6–0.61° Horizontal FOV	6.4–0.39° Horizontal FOV
Human DRI*	Detection	8.69 km (5.4 mi)	22.6 km (14.05 mi)	22.1 km (13.75 mi)	28.6 km (17.78 mi)	44.2 km (27.51 mi)
	Recognition	2.90 km (1.8 mi)	7.53 km (4.68 mi)	7.38 km (4.58 mi)	9.54 km (5.93 mi)	14.75 km (9.17 mi)
	Identification	1.45 km (0.9 mi)	3.76 km (2.34 mi)	3.68 km (2.29 mi)	4.77 km (2.96 mi)	7.38 km (4.58 mi)
Vehicle DRI*	Detection	21.08 km (13.10 mi)	54.81 km (34.06 mi)	53.6 km (33.3 mi)	55+ km (35+ mi)	55+ km (35+ mi)
	Recognition	7.02 km (4.37 mi)	18.27 km (11.35 mi)	17.88 km (11.1 mi)	23.1 km (14.37 mi)	35.7 km (22.23 mi)
	Identification	3.51 km (2.18 mi)	9.13 km (5.68 mi)	8.94 km (5.56 mi)	11.56 km (7.19 mi)	17.8 km (11.12 mi)
Drone DRI** (Small/Lrg)	Detection	2.2 km / 11.6 km	5.8 km / 30.1 km	5.7 km / 29.5 km	7.3 km / 38.1 km	11.4 km / 55+ km
	Recognition	748 m / 3.86 km	1.9 km / 10.0 km	1.9 km / 9.8 km	2.4 km / 12.7 km	3.8 km / 19.6 km
	Identification	374 m / 1.93 km	973 m / 5.0 km	953 m / 4.9 km	1.2 km / 6.3 km	1.9 km / 9.8 km
Focus		Motorized Autofocus				
Spectral Range		3,000–5,000nm (MWIR)				
Thermal Sensitivity		20–25mK				
Image Display Modes		White Hot, other color palettes available upon request				
NUC Tables		2 NUC Tables		5–7 NUC Tables		
Digital Zoom		4X Digital Zoom (16X optional)				
Video Output		CVBS (Analog) Output, optional IP encoders available				
Cooler Lifetime (@23°C)		20,000 Hour Rated MTBF				
Pan/Tilt Compatibility		Neptune/Sentry and up	Sentry and up	Sentry/Sigma and up	Sigma, Vega, Arc	

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** See DRI rating disclaimer above; Small distance based on 0.3m×0.2m target size (dimensions of a DJI Phantom), Large distance based on 2m×0.8m target size (dimensions of a DJI Agras T40/T30).

Focal lengths and FOVs are within ±5%.

Specifications subject to change due to global supply chain constraints and material availability.

MWIR SD CAMERA OPTIONS

Specifications



		120CTZ	180CTZ	235CTZ	430CTZ
Image Sensor		High-Sensitivity Cooled X-Hot Detector, 30Hz			
Resolution		640×480 or 640×512 pixels			
Pixel Pitch		10µm (50% further range than 15µm sensors)			
Focal Length		15–120mm (8X) f/3.6	25–180mm (7X) f/3.6	15–235mm (15X) f/3.6	30–430mm (14X) f/3.6
Pixels Per Meter @ 1km		12ppm	18ppm	23.5ppm	43ppm
Field of View		24.1–3.06° Horizontal FOV	14.6–2.04° Horizontal FOV	24.1–1.56° Horizontal FOV	12.2–0.85° Horizontal FOV
Human DRI*	Detection	5.7km (3.54 mi)	8.54 km (5.31 mi)	11.14 km (6.93 mi)	20.4 km (12.67 mi)
	Recognition	1.9 km (1.18 mi)	2.84 km (1.77 mi)	3.71 km (2.31 mi)	6.8 km (4.22 mi)
	Identification	949 m (0.59 mi)	1.42 km (0.88 mi)	1.86 km (1.15 mi)	3.4 km (2.11 mi)
Vehicle DRI*	Detection	13.8 km (8.57 mi)	20.7 km (12.86 mi)	27.0 km (16.79 mi)	49.4 km (30.73 mi)
	Recognition	4.6 km (2.86 mi)	6.9 km (4.29 mi)	9.0 km (5.6 mi)	16.48 km (10.24 mi)
	Identification	2.3 km (1.43 mi)	3.45 km (2.14 mi)	4.5 km (2.8 mi)	8.24 km (5.12 mi)
Drone DRI** (Small/Lrg)	Detection	1.47 km / 7.59 km	2.2 km / 11.3 km	2.88 km / 14.8 km	5.26 km / 27.2 km
	Recognition	490 m / 2.53 km	735 m / 3.8 km	959 m / 4.9 km	1.75 km / 9.0 km
	Identification	245 m / 1.26 km	367 m / 1.9 km	480 m / 2.5 km	878 m / 4.5 km
Focus		Motorized Autofocus			
Spectral Range		3,000–5,000nm (MWIR)			
Thermal Sensitivity		20–25mK			
Image Display Modes		White Hot, other color palettes available upon request			
Digital Zoom		4X Digital Zoom (16X optional)			
Video Output		CVBS (Analog) Output, optional IP encoders available			
Cooler Lifetime (@23°C)		30,000 Hour Rated MTBF			
Pan/Tilt Compatibility		Neptune/Sentry and up			Sentry and up

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** See DRI rating disclaimer above; Small distance based on 0.3m×0.2m target size (dimensions of a DJI Phantom), Large distance based on 2m×0.8m target size (dimensions of a DJI Agras T40/T30).

Focal lengths and FOVs are within ±5%.

Specifications subject to change due to global supply chain constraints and material availability.

MWIR HD CAMERA OPTIONS

Specifications



		230CTZ-HD	305CTZ-HD	430CTZ-HD	460CTZ-HD
Image Sensor		High-Sensitivity Cooled InSb or X-Hot Detector, 30Hz			
Resolution		1280×1024 pixels			
Pixel Pitch		10µm (50% further range than 15µm sensors)			
Focal Length		18–230mm (12X) f/4.0	16–305mm (19X) f/4.0	33–430mm (13X) f/4.0	30–460mm (15X) f/4.0
Pixels Per Meter @ 1km		23ppm	30ppm	43ppm	46ppm
Field of View		39.1–3.19° Horizontal FOV	43.6–2.4° Horizontal FOV	21.9–1.71° Horizontal FOV	24.1–1.59° Horizontal FOV
Human DRI*	Detection	10.9 km (6.7 mi)	14.4 km (8.9 mi)	20.4 km (12.6 mi)	21.8 km (13.5 mi)
	Recognition	3.6 km (2.2 mi)	4.8 km (3.0 mi)	6.8 km (4.2 mi)	7.2 km (4.5 mi)
	Identification	1.8 km (1.1 mi)	2.4 km (1.5 mi)	3.4 km (2.1 mi)	3.6 km (2.2 mi)
Vehicle DRI*	Detection	26.4 km (16.4 mi)	35.0 km (21.7 mi)	49.4 km (30.7 mi)	52.9 km (32.8 mi)
	Recognition	8.8 km (5.4 mi)	11.7 km (7.2 mi)	16.4 km (10.2 mi)	17.6 km (10.9 mi)
	Identification	4.4 km (2.7 mi)	5.8 km (3.6 mi)	8.2 km (5.1 mi)	8.8 km (5.4 mi)
Drone DRI** (Small/Lrg)	Detection	2.8 km (7.7 mi) / 14.5 km (9.0 mi)	3.7 km (2.3 mi) / 19.2 km (11.9 mi)	5.2 km (3.2 mi) / 27.2 km (16.9 mi)	5.6 km (3.5 mi) / 29.0 km (18.0 mi)
	Recognition	939 m (0.5 mi) / 4.8 km (3.0 mi)	1.2 km (0.7 mi) / 6.4 km (4.0 mi)	1.7 km (1.1 mi) / 9.0 km (5.6 mi)	1.8 km (1.1 mi) / 31.8 km (6.0 mi)
	Identification	469 m (0.29 mi) / 2.4 km (1.5 mi)	623 m (0.38 mi) / 3.2 km (2.0 mi)	878 m (0.55 mi) / 4.5 km (2.8 mi)	939 m (0.58 mi) / 15.9 km (3.0 mi)
Focus		Motorized Autofocus			
Spectral Range		3,000–5,000nm (MWIR)			
Thermal Sensitivity		20–25mK			
Image Display Modes		White Hot, other color palettes available upon request			
Digital Zoom		4X Digital Zoom (16X optional)			
Video Output		CVBS (Analog) Output, optional IP encoders available			
Cooler Lifetime (@23°C)		20,000 Hour Rated MTBF (InSb) / 30,000 Hour Rated MTBF (X-Hot)			
Special Features		Thermally Compensated Optics (TCO)			
Pan/Tilt Compatibility		Neptune/Sentry and up		Sentry and up	

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** See DRI rating disclaimer above; Small distance based on 0.3m×0.2m target size (dimensions of a DJI Phantom), Large distance based on 2m×0.8m target size (dimensions of a DJI Agras T40/T30).

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MWIR HD CAMERA OPTIONS

Specifications



		705CTZ-HD	915CTZ-HD	1215CTZ-HD
Image Sensor		High-Sensitivity Cooled InSb or X-Hot Detector, 30Hz		
Resolution		1280×1024 pixels		
Pixel Pitch		10µm (50% further range than 15µm sensors)		
Focal Length		60–705mm (11X) f/4.0	73–915mm (12X) f/4.0	100–1215mm (12X) f/4.0
Pixels Per Meter @ 1km		70.5ppm	91.5ppm	121.5ppm
Field of View		12.1–1.04° Horizontal FOV	10.0–0.8° Horizontal FOV	7.3–0.6° Horizontal FOV
Human DRI*	Detection	33.4 km (20.8 mi)	43.4 km (27.0 mi)	55+ km (35+ mi)
	Recognition	11.1 km (6.9 mi)	14.4 km (9.0 mi)	19.2 km (11.9 mi)
	Identification	5.5 km (3.4 mi)	7.2 km (4.5 mi)	9.6 km (5.9 mi)
Vehicle DRI*	Detection	55+ km (35+ mi)	55+ km (35+ mi)	55+ km (35+ mi)
	Recognition	27.0 km (16.7 mi)	35.0 km (21.7 mi)	46.5 km (28.9 mi)
	Identification	13.5 km (8.4 mi)	17.5 km (10.4 mi)	23.2 km (14.4 mi)
Drone DRI** (Small/Lrg)	Detection	8.6 km (5.3 mi) / 44.5 km (27.7 mi)	11.2 km (6.9 mi) / 55+ km (35+ mi)	14.8 km (9.2 mi) / 55+ km (35+ mi)
	Recognition	2.8 km (0.5 mi) / 14.8 km (9.2 mi)	3.7 km (2.3 mi) / 19.2 km (11.9 mi)	4.9 km (3.0 mi) / 25.6 km (15.9 mi)
	Identification	1.4 km (0.89 mi) / 7.4 km (4.6 mi)	1.8 km (1.16 mi) / 9.6 km (5.9 mi)	2.4 km (1.5 mi) / 12.8 km (7.9 mi)
Focus		Motorized Autofocus		
Spectral Range		3,000–5,000nm (MWIR)		
Thermal Sensitivity		20–25mK		
Image Display Modes		White Hot, other color palettes available upon request		
Digital Zoom		4X Digital Zoom (16X optional)		
Video Output		CVBS (Analog) Output, optional IP encoders available		
Cooler Lifetime (@23°C)		20,000 Hour Rated MTBF (InSb) / 30,000 Hour Rated MTBF (X-Hot)		
Special Features		Thermally Compensated Optics (TCO)		
Pan/Tilt Compatibility		Sentry, Sigma, Vega, Arc	Sigma, Vega, Arc	Sigma, Vega, Arc

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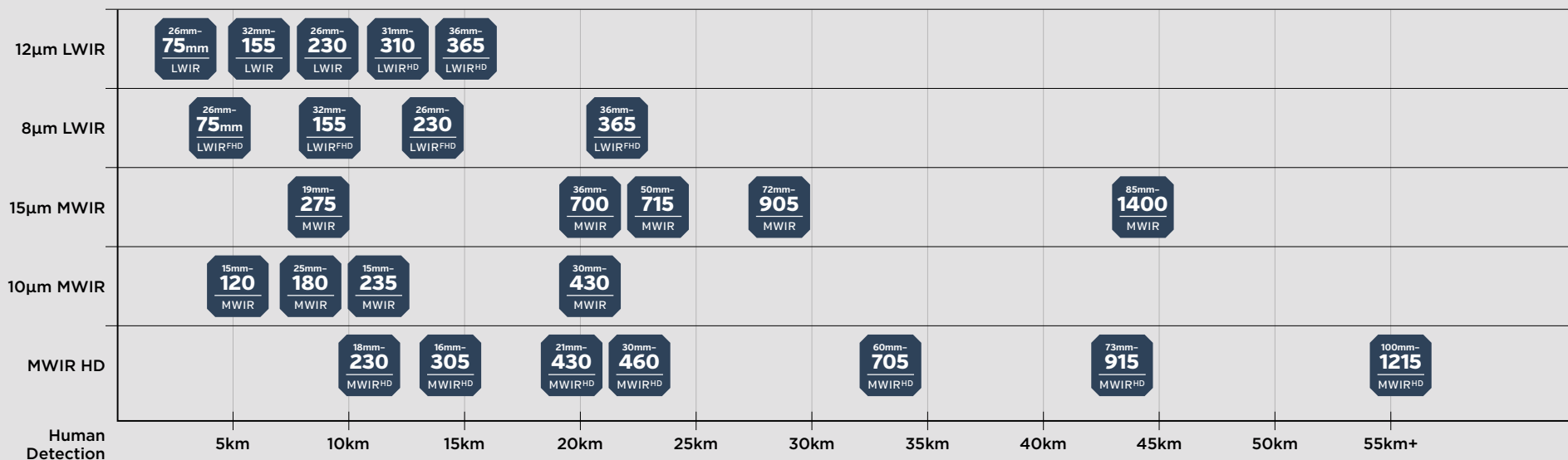
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Human DRI Detection Distances

*Please see page 4 for information on how these distances are calculated and what they mean.



Vehicle DRI Detection Distances

*Please see page 4 for information on how these distances are calculated and what they mean.

